

IN THE CLAIMS:

Please cancel claims 19-27 and add new claims 28-39 as follows.

28. A signal transmission apparatus comprising:

- a first error correction code (ECC) encoder operable to Reed Solomon encode a data stream to produce a first ECC encoded data stream;

- a second error correction code (ECC) encoder operable to Reed Solomon encode the first ECC encoded data stream to produce a second ECC encoded data stream;

- a trellis encoder operable to trellis encode the second ECC encoded data stream to produce a trellis encoded data stream;

- a modulator operable to modulate the trellis encoded data stream to produce a modulated signal; and

- a transmitter operable to transmit the modulated signal.

29. A signal receiving apparatus, comprising:

- a demodulator operable to demodulate a received signal to produce a demodulated signal;

- a trellis decoder operable to trellis decode the demodulated signal to produce a trellis decoded data stream;

- a first error correction code (ECC) decoder operable to Reed Solomon decode the trellis decoded data stream to produce an ECC decoded data stream; and

- a second error correction code (ECC) decoder operable to Reed Solomon decode the ECC decoded data stream to produce a data stream.

30. A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus:

said signal transmission apparatus comprising:

- a first error correction code (ECC) encoder operable to Reed Solomon encode a data stream to produce a first ECC encoded data stream;

- a second error correction code (ECC) encoder operable to Reed Solomon encode the first ECC encoded data stream to produce a second ECC encoded data stream;

- a trellis encoder operable to trellis encode the second ECC encoded data stream to produce a trellis encoded data stream;

- a modulator operable to modulate the trellis encoded data stream to produce a modulated signal;

- a transmitter operable to transmit the modulated signal; and
said signal receiving apparatus comprising:

- a demodulator operable to demodulate the modulated signal to produce a demodulated signal;

- a trellis decoder operable to trellis decode the demodulated signal to produce a trellis decoded data stream;

- a first error correction code (ECC) decoder operable to Reed Solomon decode the trellis decoded data stream to produce an ECC decoded data stream; and

- a second error correction code (ECC) decoder operable to Reed Solomon decode the ECC decoded data stream to produce the data stream.

31. A signal transmission method comprising:

- Reed Solomon encoding a data stream to produce a first ECC encoded data stream;

- Reed Solomon encoding the first ECC encoded data stream to produce a second ECC encoded data stream;

- trellis encoding the second ECC encoded data stream to produce a trellis encoded data stream;

- modulating the trellis encoded data stream to produce a modulated signal; and

- transmitting the modulated signal.

32. A signal receiving method, comprising:

- demodulating a received signal to produce a demodulated signal;

- trellis decoding the demodulated signal to produce a trellis decoded data stream;
- Reed Solomon decoding the trellis decoded data stream to produce an ECC decoded data stream; and
- Reed Solomon decoding the ECC decoded data stream to produce a data stream.

33. A signal transmission and receiving method comprising a signal transmission method and a signal receiving method:

said signal transmission method comprising:

- Reed Solomon encoding a data stream to produce a first ECC encoded data stream;
- Reed Solomon encoding the first ECC encoded data stream to produce a second ECC encoded data stream;

- trellis encoding the second ECC encoded data stream to produce a trellis encoded data stream;

- modulating the trellis encoded data stream to produce a modulated signal;

- transmitting the modulated signal; and

said signal receiving method comprising:

- demodulating the modulated signal to produce a demodulated signal;
- trellis decoding the demodulated signal to produce a trellis decoded data stream;
- Reed Solomon decoding the trellis decoded data stream to produce an ECC decoded data stream; and

- Reed Solomon decoding the ECC decoded data stream to produce the data stream.

34. A signal transmission apparatus comprising:

- a first error correction code (ECC) encoder operable to Reed Solomon encode a first data stream to produce a first ECC encoded data stream;

- a second error correction code (ECC) encoder operable to Reed Solomon encode the first ECC encoded data stream and a second data stream to produce a second ECC encoded data stream;

- a trellis encoder operable to trellis encode the second ECC encoded data stream to produce a trellis encoded data stream;

- a modulator operable to modulate the trellis encoded data stream to produce a modulated signal; and

- a transmitter operable to transmit the modulated signal.

35. A signal receiving apparatus, comprising:

- a demodulator operable to demodulate a received signal to produce a demodulated signal,

wherein the received signal has information of a first data stream and a second data stream;

- a trellis decoder operable to trellis decode the demodulated signal to produce a trellis decoded data stream;

- a first error correction code (ECC) decoder operable to Reed Solomon decode the trellis decoded data stream to produce an ECC decoded data stream and the second data stream; and

- a second error correction code (ECC) decoder operable to Reed Solomon decode the ECC decoded data stream to produce the first data stream.

36. A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus:

said signal transmission apparatus comprising:

- a first error correction code (ECC) encoder operable to Reed Solomon encode a first data stream to produce a first ECC encoded data stream;

- a second error correction code (ECC) encoder operable to Reed Solomon encode the first ECC encoded data stream and a second data stream to produce a second ECC encoded data stream;

- a trellis encoder operable to trellis encode the second ECC encoded data stream to produce a trellis encoded data stream;

- a modulator operable to modulate the trellis encoded data stream to produce a modulated signal;

- a transmitter operable to transmit the modulated signal; and

said signal receiving apparatus comprising:

- a demodulator operable to demodulate the modulated signal to produce a demodulated signal;

- a trellis decoder operable to trellis decode the demodulated signal to produce a trellis decoded data stream;

- a first error correction code (ECC) decoder operable to Reed Solomon decode the trellis decoded data stream to produce an ECC decoded data stream and the second data stream; and

- a second error correction code (ECC) decoder operable to Reed Solomon decode the ECC decoded data stream to produce the first data stream.

37. A signal transmission method comprising:

- Reed Solomon encoding a first data stream to produce a first ECC encoded data stream;

- Reed Solomon encoding the first ECC encoded data stream and a second data stream to produce a second ECC encoded data stream;

- trellis encoding the second ECC encoded data stream to produce a trellis encoded data stream;

- modulating the trellis encoded data stream to produce a modulated signal; and

- transmitting the modulated signal.

38. A signal receiving method, comprising:

- demodulating a received signal to produce a demodulated signal, wherein the received signal has information of a first data stream and a second data stream;

- trellis decoding the demodulated signal to produce a trellis decoded data stream;

- Reed Solomon decoding the trellis decoded data stream to produce an ECC decoded data stream and the second data stream; and

- Reed Solomon decoding the ECC decoded data stream to produce the first data stream.

39. A signal transmission and receiving method comprising a signal transmission method and a signal receiving method:

said signal transmission method comprising:

- Reed Solomon encoding a first data stream to produce a first ECC encoded data stream;

- Reed Solomon encoding the first ECC encoded data stream and a second data stream to produce a second ECC encoded data stream;

- trellis encoding the second ECC encoded data stream to produce a trellis encoded data stream;

- modulating the trellis encoded data stream to produce a modulated signal;

- transmitting the modulated signal; and

said signal receiving method comprising:

- demodulating the modulated signal to produce a demodulated signal;

- trellis decoding the demodulated signal to produce a trellis decoded data stream;

- Reed Solomon decoding the trellis decoded data stream to produce an ECC decoded data stream and the second data stream; and

- Reed Solomon decoding the ECC decoded data stream to produce the first data stream.